Available online at www.sciencedirect.com

SciVerse ScienceDirect

Procedia - Social and Behavioral Sciences 33 (2012) 143 – 147

Procedia
Social and Behavioral Sciences

PSIWORLD 2011

Critical thinking and integrated programs. The problem of transferability

Daniela Dumitru*

"Titu Maiorescu" University, Faculty of Psychology, Calea Vacaresti, no. 187, Bucharest, Romania

Abstract

Since 1980, when critical thinking becomes an important chapter in education, the modern perspective on critical thinking includes the issue of transferability *of critical and argumentation skills*. We developed an experimental design aiming at setting some light on the problem of transferable critical thinking skills. The subjects selected were students, so our research was concentrating on transferability and critical thinking skills development using integrated programs in Romanian higher education. We concluded that critical thinking skills are a complex psychological reality with different components and it is not possible that they automatically transfer to another area, once formed in a domain, and also that the integrated educational program is better than the non-integrated, lecture type, when the transfer to everyday life of critical thinking skills comes in discussion.

Keywords: critical thinking; transferable skills; integrated educational program;monodisciplinar educational program.

1. Introduction

We will begin by saying that critical thinking will have to become an essential component of classroom activities in our educational system. The numerous tests which have been unfolded at an international level, such as TIMSS, PIRLS and PISA show that in comparison to the other students from the participating countries, Romanian ones lag behind in many aspects, ranking among the last in what the assessed abilities are concerned. Romanian pupils cannot analyze the information comprised within a text, they cannot extract from context nor contextualize an elicited piece of information, they cannot answer to questions addressing a given text, nor can they understand the structure of a text.

* Corresponding author. Daniela Dumitru, Tel.: +40745098871;
E-mail address: dananita2001@yahoo.com or ddumitru@cedu.ro.

 doi:10.1016/j.sbspro.2012.01.100

In addition to this, the curricular division of the disciplines of study which we consider natural today is a relatively recent development unfolding during the last two hundred years. This naturalness, however, is totally lost when we step out of the school gates and into reality or life. Thus, the integrated curriculum becomes the instrument, or it is proposed as such, meant to shape a human being that will be perfectly integrated within reality and within a functional democracy.

2. Defining the concept of critical thinking

The process of defining critical thinking requires an interdisciplinary perspective: Philosophy (Argumentation Theory and Epistemology – Dewey (1938), Ennis (1989, 1990), Glaser (1984), Paul (1997), Psychology (Critical Attitude and Critical Disposition – Glaser (1984), Ennis (1989, 1990), Paul (1997), Education Sciences (Glaser (1984), Ennis (1989, 1990), Paul (1997).

The year 1988 sees the beginning of so called "**project Delphi**"- *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction* – „The Delphi Report" (Facione, 1988), financed by the American Philosophical Association and carried out by a cross-disciplinary team of specialists and aimed at conceptualizing "critical thinking".

Our point of view with respect to critical thinking does not differ fundamentally from the view of the Delphi panel: *critical thinking represents the reasoning and the motivated argumentation regulated by a positive attitude with respect to the forming of opinions and of any statements which support something.* The present study accepts this version as the definition of critical thinking.

3. The method

The research method we employed was the quasi-experiment of type pre-post test of non-equivalent groups (the researcher does not have the same control over variables as in the case of the experimental design). We used a basic plan with one independent variable, the educational program (a classical course of critical thinking or an integrated course of critical thinking).

3.1. Working hypotheses

The general hypothesis of the study: *integrated educational programs are a developing factor of critical thinking.* The students attending these programs will exhibit a higher capacity for argumentation, reasoning, research and critical judgement

The specific hypotheses which we test by means of this study are:

1. Subjects that follow an integrated educational program obtain better LSAT results in post-test than subjects that follow a non-integrated educational program.
2. Subjects that follow an integrated educational program obtain better Ennis-Weir test results in post-test than subjects that follow a non-integrated educational program.

3.2. The research sample, the procedure and the instruments

The participants to this research project were second year students of the Faculty of Psychology who volunteered to take part in the investigation. The students were presented with the plan of the research, more precisely, they were told that there would be two programs meant to enhance one's critical thinking. One of the programs closely mirrored the model of a so-called traditional course of Argumentation and Critical thinking, though this type of course is not that old in what the educational offer in the universities is concerned. The term "traditional" should thus be coupled with the meaning of "more recurrent" in the

academic curriculum. The teaching method employed in this course was the lecture. The other course is an integrated one, enjoying a variety of themes and topics of a wider social interest, delivered in the form of workshops. The experimental group consisted of 41 students, while the control group was comprised of 40 subjects. However, 8 subjects were subsequently eliminated from the experimental group on account of having missed too many sessions or were not tested at the end of the program. Similarly, 9 subjects from the control group could not be tested on account of not having participated in the final examination. Thus, the experimental group ended up by consisting of 33 subjects, while the control group diminished to 31. The ages of the subjects ranged between 20 and 34 years of age in the control group and between 0 and 32 years of age in the experimental group.

As a limitation to this study, we mention the fact that the sample was not randomized in any way, being constituted solely on the basis of voluntaries. This fact may be looked upon as a merged variable because we presuppose that the students who got enlisted had a special interest in or curiosity for the topic of our research (critical thinking or argumentation).

The integrated program bears the title *"Reasoning and society"*. We intend to enhance the capacity for critical thinking in connection to daily topics and to furnish the subjects with a set of skills and abilities of argumentation which may be applied to any, or to almost any context in their daily life. The course was conceived of as a *hybrid* form, beginning with an *immersion* into Critical Thinking by presenting the material or the subject and carrying on with a Socratic dialogue where problems were freely discussed; later on, when the students grasped the error, the specific terminology, the principles or the explanations, and the definitions were introduced.

The instruments employed in order to test the changes in critical thinking are: a test of type LSAT (Law School Admission Test), which was conceived and designed by the Law School Admission Council, USA, adapted for Romania by National Institut of Magistracy. The first part (50 items), namely the one concerning logical resoning, is best suited for the assessment of one's abilities for logical reasoning which we inted to enhance as a consequence of one's completing the proposed courses. We need not use the whole test, i.e., we need not use the two other sections of this test because they target psychological characteristics which are outside the scope of the method we want to test in the present experiment.

Another test, by means of which we assessed the capacity for critical thinking is the essay test designed by Robert Ennis and Eric Weir in 1985. The advantage of this test is that it requires of the subjects to judge upon a topic and to formulate a written answer as well, which should provide one with arguments meant to support the opinions they indulge in in connection to the topic of the text they are presented with.

4. Results

We calculate test t for independent samples in order to establish the difference holding between the average scores obtained by the two groups in the LSAT test.The data do not allow our accepting the advanced specific hypothesis according to which the subjects pertaining to the experimental group obtain significantly higher scores than the subjects in the control group (m1 = 20.6563, m2 = 21.6774, t = -1.153, df = 61, p = .254). The null hypothesis cannot be rejected. The size index of the effect ω^2 is 0,05, which points to a weak association between the group the subjects belong to and the results of the LSAT test (there is no significant difference function of the group the subjects belong to).

The research data enable us to accept the second advance hypothesis according to which the subjects in the experimental group, who have attended the integrated course of Critical Thinking, will obtain significantly higher results at the post-test in the case of the Ennis - Weir essay test, than the subjects pertaining to the control group (m1 = 10.6250, m2 = 13.1935, t = -4.878, df = 61, p = .0001). The size

index of the ω^2 effect is 0.27 which, according to Cohen's recommendation (apud Popa, 2008, p. 297), indicates a strong association between the results obtained at the essay test and the group to which the subjects belonged (either the experimental group or the control one). This result shows that there is a striking difference in what the score-levels are concerned, function of the group to which the subjects pertained.

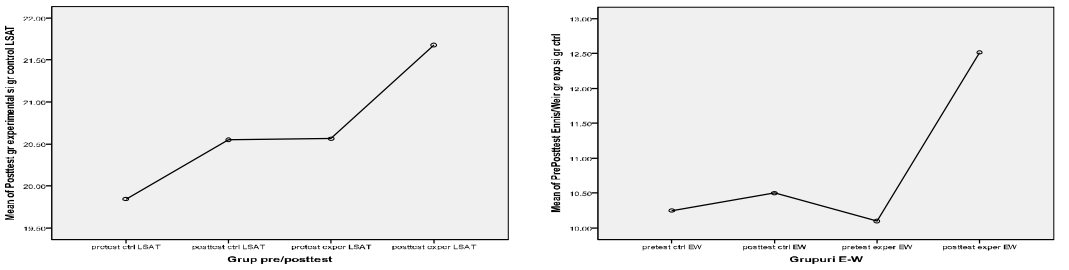

Figure 1: (a) The graphic representation of the multiple post-doc Bonferroni comparisons in the case of the LSAT test (b) The graphic representation of the multiple post-doc Bonferroni comparisons in the case of the Ennis-Weir test

5. Discussion

According to the first hypothesis there should have been a statistically significant difference between the average scores of the LSAT test in the post-test phase. This hypothesis was not confirmed by the statistical test we employed, test t for independent samples. Consequently, we may assert that the independent variable with its first variant, the integrated course of Critical Thinking, does not have a direct, testable and measurable effect on the subjects' capacity for critical thinking. At the end of the rather short period of time during which the students attended this integrated course, their performance at this test could not be differentiated from that of the subjects pertaining to the control group who had attended a classical, lecture-based course containing few applications. The texts included in the LSAT test describe daily situations or refer to various topic of general knowledge and are sufficiently informative so as to enable the testee to find the right answer. In other words, anyone, without having any special training, may try and solve the test. It is, however, possible that this type of very precise testing may not be so familiar to the subjects even if the topics taken into consideration are familiar to them and the subjects have enough data to provide an answer. It is possible that this type of testing may require a sort of training, *learning for testing*. This is how, the discussion slowly glides towards the next question, which we may encounter in some of G. McPeck's articles (1989, 1990a, 1990b), *how general is the general?* Moreover, how general is the general so that it may be transferable? The second hypothesis completes the answer. Between the post-tests pertaining to the two groups there lies a significant difference, that is, the integrated course brings forth a plus for the students who attended it in what the capacities for critical thinking measured by means of the Ennis-Weir test are concerned. Thus, in what the active manipulation of acquired notions and the employment of one's abilities for critical thinking are concerned, the integrated course proved to be more efficient than the classical one. Immersing the students in the subject of the course (immersion) and then fixing certain terms and principles that are specific to critical thinking by presenting them explicitly (infusion) is a good way to determine one's resorting to this knowledge in real life situations.

One notices that this transversal capacity, the critical thinking, is not as general as believed or as desired, at least in the case of the present research. It has certain parts, characteristic which may be transferred. The students who attended the integrated course were trained to produce arguments, to

identify fallacies and to counter them. Thus, the test which rendered this thing visible showed the fact that progress may be achieved in this way; however it is only in this way that it may be achieved. As we have seen, in the case of the LSAT test no transfer is identified. With respect to the control group, whose members were not trained at all, no transfer was identified in either of the two tests.

Consequently, we may expect that in life-like situations, in daily situations, the subjects belonging to the experimental group react when encountering a fallacy (without trying to identify which type of fallacy it is, what name it bears) and try to counter it (by attacking either the evidence or the conclusion when the latter has been wrongly drawn from the premises); on the other hand, the members of the control group are expected to hesitate or not to react at all in similar situations.

6. Conclusions:

Transferability of the basis of assuming the generality of critical thinking capacities needs to be treated carefully, one may at most claim that certain rather simple dimensions and components of critical thinking are transferable from one situation to another and that developing critical thinking in a specific domain is necessary in order to ensure the application of its principles in that domain.

1. If one aims at employing the abilities of critical thinking in daily-life situations, an integrated, trans-disciplinary or inter-disciplinary course integrating the disciplines socially is by far more suitable than a classical course in Critical Thinking, where the principles and the terminology that are specific to this domain are presented.
2. It is necessary that the actual use of critical thinking abilities take place under the guidance of a professor/trainer and within a formal environment; this aspect should not be ignored in the hope that the student will know by her/himself how to think critically.

References

Ciolan, L., (2008). *Învățarea integrată. Fundamente pentru un curriculum transdisciplinar*. Polirom. Iași.

Dewey, J., (1938). *Logic: The Theory of Inquiry*. New York: Holt.

Ennis, R., Weir, E. (1985). *The Ennis-Weir Critical Thinking Essay Test. An Instrument for Teaching and Testing*. Midwest Publications. Pacific Grove, CA.

Ennis, R., (1989). Critical Thinking and Subject Specificity: Clarification and Needed Research. *Educational Researcher*. Sage Publications. vol.18. no. 3.

Ennis, R., (1990). The Extent to Which Critical Thinking is Subject-Specific: Further Clarification. *Educational Researcher*. vol. 19. no.4.

Facione, P. A., (1990). *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction* – „The Delphi Report", prepared for Committee on Pre-College Philosophy of the American Philosophical Association. ERIC ED 315 423. California Academic Press.

Glaser, R., (1984). Education and knowledge - The role of knowledge. *American Psychologist.* 39 (2).

Lipman, M., (1991). *Thinking in Education*. Cambridge University Press.

McPeck, J. E. (1981). *Critical thinking and education*. New York: St. Martin's Press.

McPeck, J. (1990a). *Teaching Critical Thinking. Dialogue and Dialectic*. Routledge. New York and London.

McPeck, J. (1990b). Critical Thinking and Subject Specificity: A Reply to Ennis. *Educational Researcher*. vol. 19, no.4

Niță, D., Țepelea A,. Bieltz P, Dumitru M., Clitan G., Rampelt A., et. al., (2010). *Ghid pentru rezolvarea testelor de verificare a raționamentului logic*. Institutul Național al Magistraturii. http://www.inmlex.ro/fisiere/pag_9/det_1104/6162.pdf.

Paul, R., & Elder, L. (1997). Critical thinking: Implications for instruction of the stage theory. *Journal of Developmental Education*. 20 (3).